Biomarkers TES (version 5).xls

DRAFT

2084580915

	BIOMARKER	MARKER FOR	SAMPLE MATERIAL	PUBLISHED METHOD	SENSITIVITY (LLD)	SMOKE PHASE	MS CONC. (ug/cig.)	ETS OCCURRENCE	CONC. IN BIOSAMPLE (SMOKERS)	CONC. IN BIOSAMPLE (NONSMOKERS)	HALF LIFE	NON-CIGT SOURCES AND CONFOUNDERS
1	Acetonitrile	Uptake	exhalate	Proton transfer reaction MS Prazeller et al., Int. J. Mass Spectrometry 178, L1-L4, 1998; Jordan et al., Int. J. Mass Spectrometry Ion Processes 148, L1-L3, 1995; Lindinger et al., Int. J. Mass Spectrometry Ion Processes 173, 191-241, 1998		GVP	[illegible]	[illegible]	60.33 ppb +-33.34 (n=85) Jordan et al., 1995	5.65 ppb +-1.9 (n=77) Jordan et al., 1995	24 hr (Jordan et al., 1995	Endogenous sources speculated but no experimental proof; Jordan et al., 1995
		Uptake	blood	Head-space GC		GVP	[illegible]		[illegible]	[illegible]	[illegible]	
2	Cadmium	Uptake	blood	AAS (13)	0.02 ug/l	PP	100 - 200 - 68 ng/cig (12)	4.0 -37.9 ng/m3 Landsberger and Wu, Sci. Total Environ., 174/174, 323-337, 1995	0.6 ng/ml	0.2 ng/ml	15 min	Diet, occupational sources International Agency for Research on Cancer (1993). IARC Monographs on the Evaluation of Carcinogenic Risk
3	Carbon monoxide	Uptake	exhalate	Commercial instrument for direct measurement	Depends on manufacturers specifications	GVP	1.8 -13.7mg (Adams, O'Mara, Adams, Hoffmann, Toxic and carcinogeic agents in undiluted mainstream smoke and sidestream smoke fo different types of cigarettes, Carcinogenesis, 8(5), pp. 729 - 731, 1987)		17.4+-11.6 ppm (EC50 Smokerlyser: Bedfont Instruments; Middleton andMorice, Chest 117, 758-763, 2000)	1.888 +-1/3 ppm (EC50 Smokerlyser; Bedfont Instruments; Middleton andMorice, Chest 117, 758-763, 2000)	120 - 200 minutes (R. Weinreich et al., Relat. Environ. Biophys., 4, 271 280, 1975)	Incomplete combustion of organic materials; exposure to organic solvents ofwhich CO is a metabolite (e.g., methylene chloride)
4	Carboxy-hemoglobin	Carbon monoxide uptake	blood	Commerical instrument for direct measurement	Depends on manufacturers specifications	GVP (CO)	NA	NA	>2% (4.55+/-2.35%) LM Kleges et al., Am. J. Public Health 82, 1026-1029.	<2% (0.90+/-0.96%) LM Kleges et al., Am. J. Public Health 82, 1026-1029	2 to 6.5 h (6)	Incomplete combustion of organic materials; exposure to organic solvents ofwhich CO is a metabolite (e.g., methylene chloride)
5	Hb sulfinamide adducts of 3-aminobiphenyl	3-ABP uptake (N-hydroxy metabolites)	blood	GCMS (Bryant, M.S., Skipper, P.L., Wishnok, J.S., Stillwell, W.G., Glogowski Jr, J.A., Tannenbaum, S.R., Determination of hemoglobin adducts of aromatic amines by gas chromatography - mass spectrometry, In: Environmental Carcinogens Methods of Analysis and Exposure Measurement, Volume 12, Indoor Air, Seifert B, van de Wiel, Dodet, B., and O'Neill, I.K., (eds.), IARC Scientific Publications No. 109, International Agency for Research on Cancer, Lyon (1989)	Not reported in method paper	PP (3-AB)	NA	Probably below limit of detection 7/24/10	16.0 +- 7.2 pg/g Hb (Maclure et al., Am. J. Publ. Health, 79, 1381-1384, 1989		Not reported; expected to be in range reported for Hb adduct for 4-AB	
6	Hb sulfinamide adducts of 4-ABP uptake (N-hydroxy metabolites)	4-ABP uptake (N-hydroxy metabolites)	blood	GCMS (Bryant, M.S., Skipper, P.L., Wishnok, J.S., Stillwell, W.G., Glogowski Jr, J.A., Tannenbaum, S.R., Determination of hemoglobin adducts of aromatic amines by gas chromatography - mass spectrometry, In: Environmental Carcinogens Methods of Analysis and Exposure Measurement, Volume 12, Indoor Air, Seifert B, van de Wiel, Dodet, B., and O'Neill, I.K., (eds.), IARC Scientific Publications No. 109, International Agency for Research on Cancer, Lyon (1989)	LOQ reported as <10pg/g hemoglobin	PP (4-AB)	NA	Probably below limit of detection 7/24/10	154+-47 ng/g Hb (MS Bryant, et al., Cancer Res., 47, 602-608, 1987	28+-13 ng/g Hb (MS Bryant, et al., Cancer Res., 47, 602-608, 1987	7 to 9 weeks (Mooney et al., Cancer Epidemiology Biomarkers and Prev., 4, 627-6234, 1995) and ~60 days (Maclure et al., Cander Res., 50, 181-184, 1990)	Speculated potential sources of exposure to 4-ABP include metabolism of certain azo dyes and food colorants (tartrazine and sunset yellow) and reduction of ambient 4-nitrobiphenyl present in engine exhaust emissions (Bryant et al., Cancer Res., 47, 602-608, 1987) "

Biomarkers TES (version 5).xls

Biomarkers TES (version 5).xls

DRAFT

	BIOMARKER	MARKER FOR	SAMPLE MATERIAL	PUBLISHED METHOD	SENSITIVITY (LLD)	SMOKE PHASE	MS CONC. (ug/cig.)	ETS OCCURRENCE	CONC. IN BIOSAMPLE (SMOKERS)	CONC. IN BIOSAMPLE (NONSMOKERS)	HALF LIFE	NON-CIGT SOURCES AND CONFOUNDERS
7	Nicotine	Nicotine uptake	urine	Liquid chromato- graphy/atmospheric pressure-ionization/ Tandem mass spec- trometry (LC/API/ MS-MS) byrd's ref and lod book	[illegible]	PP	0.15-2.04 mg (A)	<0.01-131 ug/m3 (P)	1220 ± 20 2200 ng/24h (Byrd, 91)	NA	2 h	cigar or pipe smoking, chewing tobacco, snuff, nicotine inhaler, patches, gums
8	Cotinine	Nicotine uptake	urine	Liquid chromato- graphy/atmospheric pressure-ionization/ Tandem mass spec- trometry (LC/API/ MS-MS) byrd's ref	[illegible]	PP (nicotine)	NA	No	[illegible]	NA	10-17 h (87)	see Nicotine
9	1-3-Hydroxy cotinine	Nicotine uptake	urine	Liquid chromato- graphy/atmospheric pressure-ionization/ Tandem mass spec- trometry (LC/API/ MS-MS)		PP (nicotine)	NA	No	[illegible]	NA	5.9 h (G. Scherer et al., Klin. Wochenschr., 66(Suppl. XI), 5-11, 1988	see Nicotine
10	Nicotine N-glucoronide	Nicotine uptake	urine	Liquid chromato- graphy/atmospheric pressure-ionization/ Tandem mass spec- trometry (LC/API/ MS-MS)		PP (nicotine)	NA	No	[illegible]	NA	[illegible]	see Nicotine
11	Cotinine N-glucuronide	Nicotine uptake	urine	Liquid chromato- graphy/atmospheric pressure-ionization/ Tandem mass spec- trometry (LC/API/ MS-MS)		PP (nicotine)	NA	No	[illegible]	NA	[illegible]	see Nicotine
12	1-3-Hydroxycotinine O-glucoronide	Nicotine uptake	urine	Liquid chromato- graphy/atmospheric pressure-ionization/ Tandem mass spec- trometry (LC/API/ MS-MS)		PP (nicotine)	NA	No	[illegible]	NA	[illegible]	see Nicotine

2084580915

Biomarkers TES (version 5).xls

Biomarkers TES (version 5).xls

DRAFT

	BIOMARKER	MARKER FOR	SAMPLE MATERIAL	PUBLISHED METHOD	SENSITIVITY (LLD)	SMOKE PHASE	MS CONC. (ug/cig.)	ETS OCCURRENCE	CONC. IN BIOSAMPLE (SMOKERS)	CONC. IN BIOSAMPLE (NONSMOKERS)	HALF LIFE	NON-CIGT SOURCES AND CONFOUNDERS
13	NNAL	NNK-uptake	urine	GC-TEA: Meger et al., Eur. J. Cancer Prev., 5 (Suppl. 1), 121-124, 1996); modifications for non-smokers (Meger et al., Biomarkers, 5, 33-45, 2000.)	LOD 3 pm9oul urine using a 500 ml sample and/or (Meger et al., Biomarkers, 5, 33-45, 2000	PP (NNK)	NA; NNK ~100 - 150 ng/cig	NNK: 2.4 - 50 ng/m3 (Meger et al., Biomarkers, 5, 33-45, 2000.)	199-8059 pmol/day (Meger et al., Eur. J. Cancer Prev., 5(Suppl. 1), 121-124, 1996; Carmella et al., Cancer Res., 53, 721-724, 1993, Hecht et al., Cancer Res., 59, 590-596, 1999; Meger et al., Biomarkers 5, 33-45, 2000	LOD - 63 pmol/day (Meger et al., Biomarkers, 5, 33-45, 2000)	45.2 ± 26.9 days (92)	Use of other tobacco products (Kresty et al., Cancer Epidemiol. Biomarkers & Prev., 5, 521-525, 1996)
14	NNAL-glucoronide	NNK-uptake	urine	GC-TEA; Meger et al., Eur. J. Cancer Prev., 5 (Suppl. 1), 121-124, 1996); modifications for non-smokers (Meger et al., Biomarkers, 5, 33-45, 2000.)	Depends on method of analysis	PP (NNK)	NA; NNK ~100 - 150 ng/cig	NNK: 2.4 - 50 ng/m3 (Meger et al., Biomarkers, 5, 33-45, 2000.)	150 - 6500 pmol/day (Meger et al., Eur. J. Cancer Prev., 5(Suppl. 1), 121-124, 1996; Carmella et al., Cancer Res., 53, 721-724, 1993, Hecht et al., Cancer Res., 59, 590-596, 1999; Meger et al., Biomarkers 5, 33-45, 2000).	LOD - 91 pmol/day (Meger et al., Biomarkers, 5, 33-45, 2000)	39.6 ± 26.0 days (92)	Use of other tobacco products (Kresty et al., Cancer Epidemiol. Biomarkers & Prev., 5, 521-525, 1996)

10/25/00

Source: https://www.industrydocuments.ucsf.edu/docs/hrlg0003